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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/598,395	06/20/2000	Michael J. Natan	PSU 00 2182A	6068

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EXAMINER

MARSCHER, ARDIN H

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/598,395

Applicant(s)

NATAN ET AL.

Examiner

Ardin Marschel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/12/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-10, 15-17 and 87-96 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-10, 16, 17, & 87-96 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date (2 sheets).
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission, filed on 11/12/04, has been entered.

Thus, upon reconsideration, the following rejections and/or objections are newly applied. They constitute the complete set presently being applied to the instant application.

### **INTERPRETATION OF THE FREESTANDING LIMITATION IN THE INSTANT CLAIMS**

On page 14, line 29, through page 15, line 8, the "freestanding" limitation is defined as nanobar codes "produced by some form of deposition or growth within a template" and "have been released from the template". "Nanobar codes that are not produced by some form of deposition or growth within a template (e.g., self-assembled nanobar codes) may be considered freestanding even though they have not been released from a template." Also: "The term "free standing" does not imply that such nanoparticles must be in solution (although they may be) or that the nanobar codes can not be bound to, incorporated in, or a part of a macro structure."

### **PRIOR ART**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 7-10, 16, 17, and 87-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doudin et al. [NanoStructured Materials 6:521 (1995)].

In the abstract of Doudin et al., template synthesis of alternated different metals, resulting in wire preparation, is described via electrodeposition in membrane pores.

Such preparation by electrodeposition is reasonably a method of making consistent with the above deposition process regarding preparing a freestanding particle as instantly claimed when combined with releasing the particle from its template. The release from said template is described in the reference on page 523, lines 2-10, wherein membrane

dissolution is described. In the abstract on page 521 of the reference, the pore diameter and thus the wire diameter is cited as being 30 nm to a few  $\mu\text{m}$  which are species within instant claim 1, for example, of generally circular pore templates. The separate layers of the multilayered wires of the reference were deposited as disclosed in the paragraph bridging pages 521 and 522. Such layers are reasonably deposited in segments, called disks in the reference with transitions perpendicular to the particle length as also required in instant claim 1. Copper and Cobalt segments are described on page 522 which corresponds to the instantly claimed particle segment options cited in the last line of instant claim 1. On page 521, first paragraph, the reference described concentrating on membranes for deposition which are generally 6  $\mu\text{m}$  thick which also falls within the particle length range as instantly claimed in claim 1 as the membrane thickness defines particle length. On page 524, lines 12-18, ranges of diameters or particle diameter, disk thickness and distance therebetween, mediated by "other metal" deposition, are listed as being enabled by their method which suggests and motivates a wide variety of species of particle dimensions and segment dimensions within the instantly claimed invention. For example, for a 6  $\mu\text{m}$  membrane thickness, utilized for deposition, a disk thickness of 2  $\mu\text{m}$  (suggested by the phrase "few  $\mu\text{m}$ " with a disks separation also of a 2  $\mu\text{m}$  (also suggested by a few  $\mu\text{m}$ ) on page 524 of the reference results in the number of segments being 3 which also falls within the number as instantly claimed in lines 1-2 of instant claim 1. If smaller disk and "other metal" separations are utilized as clearly suggested options within the page 524 list of dimensions, more multilayers in a wire of the reference are suggested and motivated

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approaching the 50 segment count as also instantly claimed. The wires of the reference are suggested and motivated as being useful in electronic applications on page 521, paragraph after the abstract and on page 524, first paragraph, describing GMR usage, as also claimed in instant claim 16 and 17.

Thus, it would have been obvious to someone of ordinary skill in the art at the time of the instant invention to prepare a wide variety of multilayered wire types as described in Doudin et al. as suggested and motivated species therein as described above thus resulting in the practice of the instant invention.

#### **CITATION OF INTEREST**

Nagodawithana et al. [Electrochemical Society Proceedings 95-8:237 (1995)] is cited on the enclosed PTO Form 892 due to disclosing nanowires prepared by electrodeposition with multilayering of Cobalt and Copper with segments and diameters as instantly claimed, however, the number of such layers in the reference nanowire disclosure is cited at 200 layers which exceeds the number of segments for the particles as instantly claimed.

Claim 15 is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., AU 1631 Supervisory Patent Examiner, whose telephone number is (571) 272-0718. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

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Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instrument Examiner, Tina Plunkett, whose telephone number is (571) 272-0549.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 30, 2005

*Ardin H. Marschel* 5/30/05  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER